

CLAIMS

What is claimed is:

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1 1. A method for interactive debugging comprising:
2 selecting a target construct for debugging;
3 accessing data related to an operation of the target construct by a debug
4 construct; and
5 monitoring at least a portion of the data without disturbing the operation of the
6 target construct to debug the target construct.

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1 2. The method of claim 1 further comprising modifying at least a portion of the
2 data.

1 3. The method of claim 1 wherein the target construct is one selected from the
2 group consisting of a service, a socket, a service stack, a set of services, and a set of
3 sockets.

1 4. The method of claim 1 wherein the debug construct comprises at least one
2 service, at least one socket, or a combination of at least one service and at least one
3 socket.

1 5. The method of claim 1 wherein selecting a target construct further comprises:
2 providing information about a plurality of services; and

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selecting the target construct from the plurality of services.

1 6. The method of claim 5 wherein the information includes a current state of each of
2 the plurality of services.

1 7. The method of claim 5 further comprising:
2 providing information about a plurality of sockets; and
3 selecting the target construct from the plurality of sockets.

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1 8. The method of claim 7 wherein the information includes a current state of each of
2 the plurality of services.

1 9. The method of claim 1 further comprising accessing a memory of the target
2 construct by the debug construct, the accessing corresponding to reading the memory
3 or writing to the memory.

1 10. The method of claim 1 further comprising accessing state of the target construct
2 by the debug construct, the accessing corresponding to reading the state or modifying
3 the state.

1 11. The method of claim 1 further comprising dynamically allocating the debug
2 construct.

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1 12. The method of claim 1 further comprising dynamically de-allocating the debug
2 construct once the monitoring is completed.

1 13. The method of claim 1 further comprising collecting statistics related to the target
2 construct.

1 14. The method of claim 1 further comprising transmitting the data to at least one
2 host system.

1 15. The method of claim 14 wherein the data is transmitted based upon a request
2 sent by a host application.

1 16. The method of claim 14 wherein an operating system determines which data is to
2 be transmitted.

1 17. The method of claim 14 wherein the debug construct specifies which data is to be
2 transmitted.

1 18. The method of claim 1 further comprising notifying the debug construct upon a
2 completion of a certain operation by the target construct.

1 19. The method of claim 14 further comprising:

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measuring bandwidth required to transmit the data; and
transmitting at least a portion of data based upon available bandwidth.

20. The method of claim 1 wherein debugging is performed in a multi-channel, multi-service environment.

21. The method of claim 15 wherein sending the request and transmitting the response are performed over a network.

22. The method of claim 1 further comprising:
collecting at least a portion of the data;
allocating a copy of the target construct in a simulated environment; and
debugging the operation of the target construct using the collected data in the simulated environment.

23. The method of claim 1 further comprising:
generating a request by a host application;
transmitting the request to an operating system;
performing the request by the operating system; and
sending a response to the host application.

24. A method for multi-channel, multi-service debugging, comprising:

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providing information about at least one service;
3 maintaining an isolated debugging environment for each of the at least one
4 service; and
5 selecting a target construct for debugging from the at least one service.

1 25. The method of claim 24 wherein the information about the at least one service
2 includes a current state of each service.

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1 26. The method of claim 24 further comprising:
2 providing information about at least one socket;
3 maintaining an isolated debugging environment for each of the at least one
4 socket; and
5 selecting a target construct for debugging from the at least one socket.

1 27. The method of claim 26 wherein the information about the at least one socket
2 includes a current state of each socket.

1 28. The method of claim 24 wherein the target construct is one selected from the
2 group consisting of a service, a socket, a service stack, a set of services, and a set of
3 sockets.

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1 29. The method of claim 28 further comprising switching between services and
2 sockets during a debugging process.

1 30. The method of claim 24 wherein the isolated debugging environment is
2 maintained by an operating system in cooperation with a host application.

1 31. The method of claim 24 wherein the target construct is selected based upon a
2 request from a host application.

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1 32. The method of claim 24 further comprising:
2 generating a request by a host application;
3 transmitting the request to an operating system;
4 performing the request by the operating system; and
5 sending a response to the host application.

1 33. The method of claim 32 wherein transmitting the request and sending a response
2 are performed over a network.

1 34. The method of claim 24 further comprising:
1 sending a request by a host application; and
2 receiving a response by the host application once a requested operation is
3 completed.

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1 35. The method of claim 34 wherein sending a request and receiving a response are
2 performed over a network.

1 36. The method of claim 24 further comprising:
1 receiving a request by an operating system;
2 performing a requested operation; and
3 transmitting a response once the requested operation is completed.

1 37. The method of claim 36 wherein receiving a request and transmitting a response
2 are performed over a network.

1 38. The method of claim 24 further comprising dynamically allocating at least one
2 service into the target construct.

1 39. The method of claim 38 further comprising instantiating any of at least one
2 service, at least one service stack, and at least one socket.

1 40. The method of claim 24 further comprising substituting input and output data
2 for at least one socket.

1 41. The method of claim 40 further comprising:
2 collecting data for at least one socket;

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3 allocating a copy of the target construct in a simulated environment; and
4 debugging the operation of the target construct using the collected data.

1 42. An apparatus for interactive debugging comprising:
2 means for selecting a target construct for debugging;
3 means for accessing data related to an operation of the target construct by a
4 debug construct; and
5 means for monitoring at least a portion of the data without disturbing the
6 operation of the target construct.

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1 43. An apparatus for multi-channel, multi-service debugging, comprising:
2 means for providing information about at least one services;
3 means for maintaining an isolated debugging environment for each of the at least
4 one service; and
5 means for selecting a target construct for debugging from the at least one service.

1 44. An apparatus for interactive debugging comprising:
2 a target construct; and
3 a debug construct configured to access data related to an operation of the target
4 construct in real time and to monitor at least a portion of the data without disturbing
5 the operation of the target construct.

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1 45. The apparatus of claim 44 wherein the debug construct is further configured to
2 modify at least a portion of the data.

1 46. The apparatus of claim 44 wherein the target construct is one selected from the
2 group consisting of a service, a socket, a service stack, a set of services, and a set of
3 sockets.

1 47. The apparatus of claim 44 wherein the debug construct comprises at least one
2 service, at least one socket, or a combination of at least one service and at least one
3 socket.

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1 48. The apparatus of claim 44 further comprising a user interface for providing
2 information about a plurality of services and selecting the target construct from the
3 plurality of services upon a user request.

1 49. The apparatus of claim of claim 48 wherein the information about a plurality
1 of services includes a current state of each of the plurality of services.

1 50. The apparatus of claim 48 wherein the user interface further provides
2 information about a plurality of sockets and allows the user to select the target construct
3 from the plurality of sockets.

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1 51. The apparatus of claim of claim 50 wherein the information about a plurality
1 of sockets includes a current state of each of the plurality of sockets.

1 52. The apparatus of claim 48 wherein the user interface is a text-based interface or
2 graphical user interface.

1 53. The apparatus of claim 44 further comprising a platform control socket
2 configured to dynamically allocate the debug construct.

1 54. The apparatus of claim 44 further comprising a platform control socket further
2 configured to dynamically de-allocate the debug construct once the monitoring is
3 completed.

1 55. The apparatus of claim 44 further comprising a profiler collecting statistics
2 related to the target construct.

1 56. The apparatus of claim 44 further comprising:
2 at least one host processor; and
3 a communications infrastructure for transmitting the data to the host processor.

1 57. The apparatus of claim 56 further comprising an operating system configured to
2 determine which data is to be transmitted, measure bandwidth required to transmit the

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3 data, and determine a portion of the data to be transmitted based upon available
4 bandwidth.

1 58. The apparatus of claim 56 wherein the debug construct is further configured to
2 specify which portion of the data is to be transmitted.

1 59. The apparatus of claim 56 wherein the data is transmitted based upon the
2 request sent by a host application.

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1 60. The apparatus of claim 44 wherein debugging is performed in a multi-channel,
2 multi-service environment.

1 61. The apparatus of claim 56 further comprising:
2 a host application generating a request;
3 a communications infrastructure transmitting the request to the debug construct;
4 and
5 the debug construct configured to perform the request and to send a response to
6 the host application.

1 62. The apparatus of claim 61 wherein the communications infrastructure is a
2 network.

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1 63. The apparatus of claim 56 further comprising a host application sending a
2 request and receiving a response once a requested operation is completed.

1 64. The apparatus of claim 63 wherein the host application sends a request and
2 receives a response over a network.

1 65. The apparatus of claim 56 wherein the debug construct is further configured to
2 receive a request, perform a requested operation, and transmit a response once the
3 requested operation is completed.

1 66. The apparatus of claim 65 wherein the debug construct receives the request and
2 transmits the response over a network.

1 67. An apparatus for multi-channel, multi-service debugging, comprising:
2 a graphical user interface for providing information about at least one service;
3 an operating system maintaining an isolated debugging environment for each of
4 the at least service; and
5 a debug core configured to select a target construct for debugging from the at
6 least one service upon a user request.

1 68. The apparatus of claim 67 wherein the information about the at least one service
2 includes a current state of each service.

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1 69. The apparatus of claim 67 wherein the graphical user interface provides
2 information about at least one socket, the operating system maintains an isolated
3 debugging environment for each of the at least socket, and the debug core is configured
4 to select a target construct for debugging from the at least one socket upon a user
5 request.

1 70. The apparatus of claim 69 wherein the information about the at least one socket
2 includes a current state of each socket.

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1 71. The apparatus of claim 67 wherein the target construct is one selected from the
2 group consisting of a service, a socket, a service stack, a set of services, and a set of
3 sockets.

1 72. The apparatus of claim 67 wherein the debug core is further configured to switch
2 between services and sockets during a debugging process upon a user request.

1 73. The apparatus of claim 67 further comprising a host application configured to
2 send a request to select the target construct.

1 74. The apparatus of claim 73 further comprising:
2 a communications infrastructure transmitting the request to an operating system;
3 and

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the operating system configured to perform the request.

1 75. The apparatus of claim 74 wherein the communications infrastructure is a
2 network.

1 76. The apparatus of claim 67 further comprising a host application sending a
2 request for a debugging operation and receiving a response once the operation is
3 completed.

1 77. The apparatus of claim 67 wherein the operating system receives a request for a
2 debugging operation, performs the operation, and transmits a response once the
3 requested operation is completed.

1 78. The apparatus of claim 67 further comprising a host application requesting to
2 dynamically allocate at least one service into the target construct and to instantiate at
3 least one service or at least one service stack.

1 79. The apparatus of claim 67 wherein a host application cooperates with the
2 operating system to substitute input and output data for at least one socket.

1 80. The apparatus of claim 79 wherein the host application is configured to request
2 to collect data for at least one socket, to allocate a copy of the target construct in a

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3 simulated environment, and to debug the operation of the target construct using the
4 collected data in the simulated environment.

1 81. A system for interactive debugging, comprising:
2 a memory configured to store data related to an operation of a target construct;
3 and
4 at least one processor coupled to the memory, the processor configured to select
5 the target construct for debugging, access the data in the memory in real time, and
6 monitor at least a portion of the data from the memory without disturbing the operation
7 of the target construct to debug the target construct.

1 82. A system for multi-channel, multi-service debugging, comprising:
2 a memory configured to store information at least one service; and
3 at least one processor coupled to the memory, the processor configured to
4 maintain an isolated debugging environment for each of the at least one service and to
5 provide a capability to view the information stored on the memory and to select a target
6 construct for debugging from the information.

1 83. A computer readable medium comprising instructions, which when executed on
2 a processor, perform a method for interactive debugging comprising:
3 selecting a target construct for debugging;

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